REMARKS

The following uses the paragraph numbering of the Office Action.

Paragraph 4

Claims 1-4, 6-12, 14, 16, 21 and 22 stand rejected under Section 102(e) as being anticipated by US Patent 6, 304,634 ("Hollier").

It will be shown that applicant claims a different invention not disclosed by Hollier:

(A) Hollier uses two test devices (21, 22) to test **transmission quality** of a transmission path (20), as represented in Fig. 1, while

(B) Applicant uses a test apparatus (16) and a transmission path (14) to verify **call-flow accuracy** of an operative system (10), as represented in Fig. 1.

Both Hollier and applicant send and receive messages over a communication link and partially use similar techniques, but to accomplish different results. The objective of Hollier is to test the **quality** of performance of a transmission path. Hollier fails to teach how to verify call-flow accuracy of an operative system (e.g., an interactive audio system for processing customer calls). Cl. 10, line 30 – Cl. 11, line 45.

As a result, Hollier fails to disclose applicant's invention and also fails to disclose each element of applicant's claims. The Hollier disclosure is thus inadequate to anticipate.

THE HOLLIER DISCLOSURE

As stated by Hollier: "This invention relates to the **quality assessment** of communications systems." (Col. 1, lines 607; emphasis added.)

In Fig. 1, Hollier shows an "outline structure for a quality assessment (QA) system" whereby one of measurement devices 21 and 22 "initiates a conversation" and speaks words or phrases to the other measurement device over a communication link of network 20 whose **quality** of transmission is to be tested. The objective being "to obtain a comprehensive assessment of the quality of the link as a whole." (Col. 7, lines 28-54.)

As specified by Hollier:

> The key measurement to be made on the network under test is the **quality of conversational speech**. (Col. 5, lines 31-32.)

At column 5, lines 32-50, Hollier provides a listing of "different factors" upon which that "key measurement" depends. These factors address aspects of quality of speech transmission. However, verification of call-flow accuracy is not a factor identified as relevant by Hollier.

THE INVENTION

Interactive voice response (IVR) systems are widely used. As such, the satisfaction of a bank's customers may depend on the accuracy of call-flow performance as provided by an IVR system used by the bank, for example. If a customer calls to get current account information and the bank's IVR system provides an inappropriate voice message in response, the customer may become irritated. The bank may lose such irritated customers without knowing why.

An efficient way of verifying the actual flow of messages (e.g., "call-flow verification") is thus highly desirable. Applicant provides for call-flow verification. Hollier focuses on transmission quality and fails to disclose or suggest any solution to the problem of call-flow verification.

As concisely stated in the opening sentence of the application:

> This invention relates to testing of interactive audio systems and, more particularly, to **verification of content and flow** of messages or prompts provided by a voice response system in the course of processing a user call. (Emphasis added.)

Fig. 8 outlines a call-flow verification method. As a simplified example, automatic call generator 16 places calls to interactive voice system 10 which simulate a call a bank customer might place to obtain account information. IVR system 10 provides response messages as it would to a bank customer. In order to permit efficient analysis of response messages to test whether the IVR system 10 is sending incorrect messages to customers, for test purposes the response messages are represented by coded DTMF signals. By use of the coded signals to represent a voice message which would be sent to a customer, computer analysis can be employed to rapidly process the coded signals so that a large volume of test calls can be processed. A prior alternative of testing voice messages directly for accuracy requires steps such as use of voice recognition, which reduce speed of analysis and may introduce recognition errors. During testing the actual voice message which would be sent to a customer can be omitted and represented only by the coded signal. By comparing the coded representation of a voice message (i.e., "utterance") against the content of a correct utterance, call-flow can be verified and call-flow discrepancies identified.

Coded Signals

Pursuant to the invention, call-flow verification is arranged to operate to test operation of interactive audio systems which incorporate a call-flow verification (CFV)

mode in which prompt signals are formulated with **inclusion of coded signals** which represent content of utterances.

In one embodiment such prompt signals are **composite** prompt signals which include both an utterance and coded signals framing the utterance (e.g., before and after the voice message). Examples of such composite prompt signals are shown in Fig. 7A as Prompt Signals "A" identified by the bracket on the right side of Fig. 7A. Formatting and content of a composite prompt signal for CFV mode operation are described in greater detail on page 12 of the specification and the particular example of the prompt signals "A" is described at lines 12-24 of page 12. Other forms of prompt signals, such as versions including coded versions of the utterance but excluding the actual audio voice utterance during testing, are also described.

To take advantage of efficiencies in call-flow verification made possible by the provision of utterance content in the form of coded signals in prompt signals, applicant's methods and apparatus provide for comparing utterance content as represented by such coded signals against correct utterance content stored in advance for use in such comparisons. A record of call-flow discrepancies identified in received prompts can be used to enable corrective action to be taken.

Claim Terminology

Terms used in applicant's claims include:

- "prompt signals" – these are signals sent **from** an interactive audio or IVR system;
- "utterance" – this is the voice or audio portion of a prompt signal (e.g., a verbal message);

- "content of utterance" – this may be all or a portion of the actual content or wording of an utterance (e.g., "please enter your account number");
- "coded signals" – a coded representation of all or a portion of utterance content (e.g., "please enter your account number" in coded DTMF format);
- "utterance label" – an utterance may be identified by a shortened representation of the full utterance (e.g., rather than the full utterance "please enter your account number", a shortened or abbreviated form or "label" may be included in coded signals to accurately represent or identify the utterance);
- an interactive voice response (IVR) system is a specific form of the more general "interactive audio system."

ANTICIPATION

As stated in the Manual of Patent Examining Procedure (MPEP):

> a claim is anticipated only if **each and every element as set forth in the claim** is found, either expressly or inherently described, in a single prior art reference.

Further:

> The **identical invention** must be shown in as complete detail as is contained in the . . . claim. (MPEP Section 2131, citing authorities; emphasis added.)

As will be shown, in the present case Hollier fails to disclose the "identical invention" and all elements of applicant's claims are not either expressly or inherently described in Hollier.

CLAIM 1

Claim 1 is directed to a "call-flow verification method" as recited in the preamble.

Pursuant to MPEP Section 2111.02, the preamble may recite limitations of the claim. Claim 1 has now been amended to specifically recite call-flow verification as a limitation of step (d). As amended, step (d) specifically provides:

> (d) comparing content of said utterance label, as represented by such coded signals . . ., against content of an expected utterance label . . . **to provide call-flow verification and identify call-flow discrepancies.** (Claim 1, lines 12-15; emphasis added.)

In the specification, at page 13, with reference to such operation it is explained that:

> Such discrepancies may include an inaccurate utterance, a missing utterance, an out of order utterance, etc. Absent any discrepancy, accuracy of call-flow may be confirmed. In this manner call-flow is verified for a single simulated user call. (Page 13, lines 22-31.)

As described above, in contrast Hollier discloses only systems and methods for "quality assessment" of a communication link by the "key measurement" of the "quality of conversational speech" passing between test units 21 and 22 over the communication link 20, as represented in Fig. 1. Hollier fails to disclose or suggest anything about any

method capable of "comparing content" to "provide call-flow verification and identify call-flow discrepancies" as provided in claim 1, as amended.

Hollier may make comparisons of speech quality for purposes of the "quality assessment" of a communication link, however, Hollier is not interested in call-flow verification or call-flow discrepancy identification. On an over-simplified basis, Hollier always assumes call-flow is accurate and tests for quality of transmission deficiencies, while applicant always assumes transmission quality is adequate and tests for call-flow discrepancies. Since Hollier fails to disclose any method for call-flow verification, Hollier fails to disclose the "identical invention" as required to anticipate.

In addition to failing to disclose step (d) for the reasons given above, Hollier fails to disclose other elements of claim 1.

1. As to the preamble, Hollier fails to disclose any system:

   having a call-flow verification (CFV) mode in which content of utterances responsive to an incoming call is **represented by coded signals** included in prompt signals (claim 1, lines 2-4).

In column 7, beginning at line 65, Hollier states that: "During a perfect conversation (with no loss or delay) each device 21, 22 would **speak a predetermined sequence of words or phrases**, in response to phrases received from the other device." (Emphasis added.) Thus, there is no coding of utterance content; each device 21, 22 acts to simply "speak" an utterance. As indicated in applicant's Fig. 2, an IVR may "speak" an utterance. However, as indicated in applicant's Fig. 5, for example, in addition to speaking an utterance (e.g., "Press one for date"), the content is also represented by coded

signals (e.g., "DTMF 0", "DTMF 8", etc.) as shown. Hollier provides no disclosure anticipating the claim 1 provision for coded signals.

At column 8, lines 32-35, Hollier refers to inclusion of originating device labels to identify "speech communicated by each device" 21, 22. However, no disclosure by Hollier of representation of **content** of utterances by coded signals has been identified.

2. As to step (c) of claim 1, Hollier provides no disclosure of any step of receiving any prompt signal which includes:

> coded signals representing content of an utterance label (claim 1, lines 10-11).

As set out above, Hollier fails to disclose representation of utterance content in coded signals.

3. As to step (d) of claim 1, Hollier also fails to provide disclosure of any step involving:

> comparing content of said utterance label, as represented by such coded signals . . ., against content of an expected utterance label (claim 1, lines 12-14).

At column 8, lines 13-20, Hollier describes "comparison between received and expected **speech**" (i.e., speech to speech comparison, however no use of coded signals for comparison) to analyze factors "such as **echo, noise and filtering** of the signal" (emphasis added). These factors are relevant to **quality** of transmission analysis. Hollier excludes mention of comparison of **content** for call-flow verification or for any other purpose.

Hollier **must compare actual speech signals** on the basis of such transmission factors, since Hollier states that the "key measurement" is "the quality of conversational speech" (col. 5, lines 31-32). There is no disclosure suggesting Hollier would be able to make such measurement using representative coded signals (e.g., as in claim 1), instead of actual speech as taught by Hollier.

For these reasons, Hollier fails to anticipate because Hollier fails to describe "each and every element as set forth in the claim" as specified in MPEP Section 2131.

Reconsideration and allowance of claim 1, as amended are requested.

DEPENDENT CLAIMS 2-4 and 6-10

These claims, which would become allowable with allowance of claim 1, include additional distinguishing limitations.

For example, claim 2 provides for "activating the CFV mode by sending the CFV sequence code." In the Abstract and beginning at column 2, line 64 Hollier describes activating a method when a first measurement device "makes a call" and "the devices converse using predetermined speech signals." Hollier discloses nothing about sending any sequence code to activate a call-flow verification (CFV) mode.

Claim 3 has been amended to more particularly refer to types of discrepancies as discussed at page 13, lines 27-31, of the specification. Hollier fails to describe or suggest anything similar. Hollier tests for factors related to quality of transmission, as discussed above.

Claim 6 refers to activation by a remotely transmitted CFV mode activation command. Having no CFV mode in which utterance content is represented by coded signals, Hollier discloses nothing similar.

Claim 7 refers to CFV mode activation on a "per call basis" or "a basis covering a plurality of calls." Having no CFV mode in which utterance content is represented by coded signals, Hollier discloses nothing similar.

Claim 8 refers to CFV mode activation by CFV sequence code. Having no CFV mode in which utterance content is represented by coded signals, Hollier discloses nothing similar. Hollier does not suggest that a device speaking an utterance should in any way use any form of sequence code.

CLAIM 11

Claim 11, which refers in the preamble to a "call-flow verification method" and in step (c) to "identifying discrepancies", has been amended at step (c).

As amended, step (c) specifically provides:

> (c) comparing content of an utterance label as represented by coded signals . . . with predetermined content of a correct utterance label and identifying call-flow discrepancies to provide call-flow verification. (Claim 11, lines 9-11; emphasis added.)

To avoid repetition, the discussion above regarding claim 1 is repeated here by reference. For the reasons given, Hollier fails to disclose or suggest either the identical invention as claimed or each and every element as set forth in claim 11. It is respectfully submitted that the disclosure of Hollier is inadequate to anticipate claim 11, as amended.

Reconsideration and allowance of claim 11, as amended, are requested.

DEPENDENT CLAIM 12

Claim 12, which would become allowable with allowance of claim 11, includes additional distinguishing limitations.

Claim 12 specifies "activating the CFV mode by sending the CFV sequence code." As discussed above, Hollier does not disclose a CFV mode with utterance content in coded form, or any comparable step.

CLAIM 14

To avoid repetition, the discussion above regarding claim 1 is repeated here by reference. Additionally, the steps of claim 14 include further distinguishing limitations.

As to step (a), there are provided:

(i) "an IVR system having a selectable CFV mode in which content of utterances responsive to an incoming call is represented by coded signals in prompt signals,"

(ii) "the CFV mode selectable by a CFV sequence code."

Based on the discussion above, Hollier fails to disclose any system having a selectable CFV mode as specified and fails to disclose such a CFV mode which is selectable by a CFV sequence code.

As to step (c), Hollier fails to disclose activating a CFV mode by sending a CFV sequence code. Hollier does not use any sequence code to activate anything.

As to step (f), Hollier fails to disclose "comparing content of an utterance label, as represented by coded signals . . . to provide call-flow verification and identify call-flow discrepancies." At column 10, lines 21-25, with respect to assessing quality of a received message, Hollier specifically states:

> Note that this step measures the **quality** of the signal received by device 32, **independently of its content.** (Emphasis added.)

Thus, step (f) provides for content comparison as specified, while Hollier makes it perfectly explicit that quality of a signal is measured **independently of its content**.

It would be difficult to more clearly characterize the distinction between the Hollier lack of interest in message content and the provisions of step (f) of claim 14. Thus, for the reasons given it is respectfully submitted that as to claim 14 Hollier fails to teach the identical invention, fails to teach each and every element, and fails to anticipate.

Reconsideration and allowance of claim 14, as amended, are requested.

DEPENDENT CLAIM 16

Claim 16, which would become allowable with allowance of claim 14, includes additional distinguishing limitations.

Claim 16 has been amended to more particularly refer to types of discrepancies as discussed at page 13, lines 27-31, of the specification. Hollier tests for quality of transmission and fails to disclose step (g) of claim 16, as amended.

CLAIM 21

Claim 21 is directed to a call-flow verification apparatus comprising an encoding circuit and an activation circuit as described.

The encoding circuit is arranged "to provide coded signals representative of content of utterances in coded format" (lines 4-5). In view of the discussion above regarding claim 1, it is clear that Hollier teaches nothing about representing utterances in coded format by coded signals. That would be directly contrary to the objective of Hollier which concerns the quality of transmitted speech. Hollier requires units 21, 22 to "speak" utterances so that transmission link quality can be assessed via the "key measurement" of "the quality of conversational speech" as transmitted (col. 5, lines 31-

32). Providing utterances in coded form, rather than as conversational speech, would be contrary to the Hollier disclosure.

The activation circuit of claim 21 enables activation of the encoding circuit so the coded signals are provided in a form usable for call-flow verification purposes. Hollier teaches nothing about call-flow verification and prompt signals in coded form are neither disclosed by Hollier, nor useful in the key measurement of "quality of conversational speech" as transmitted by a transmission link.

At column 5, lines 31-50, Hollier sets out factors relevant to the "key measurement" of "the quality of conversational speech". Consistent with that, at column 7, lines 29-59, Hollier states that "the devices 21, 22 communicate through the network 20 **using speech-like signals**" (emphasis added). Again, this is contrary to use of prompt content represented in coded form.

It is respectfully submitted that, in view of the clearly stated reliance by Hollier on speech-like signals, Hollier fails to anticipate claim 21.

Reconsideration and allowance of claim 21, as amended, are requested.

DEPENDENT CLAIM 22

Claim 22, which would become allowable with allowance of claim 21, includes additional distinguishing limitations.

In the call-flow verification apparatus of claim 22, the activation circuit permits selection of prompt signal format. Both of the selections specified in the claim include coded signals which, as discussed, are not disclosed by Hollier as having any application to the testing configurations of Hollier.

Paragraph 6

Claims 5, 13, 15 and 24 stand rejected under Section 103(a) as being unpatentable over Hollier and in view of US Patent 6,321,198 ("Hank").

Hank is relied upon as teaching that **caller** speech can be converted to ASCII format. Regardless of the relevance, or lack thereof, of Hank to the use of ASCII characters in applicant's novel composite prompt signals (e.g., including message content in coded form to facilitate testing and including or excluding message content in verbal form) the Hank disclosure fails to address the inadequacy of the teaching of Hollier regarding the basic elements of the respective parent claims 1, 11, 14 and 21 as described at length above.

Applicant is not claiming use of characters in ASCII format in the abstract. Hank adds nothing to Hollier with respect to configurations of prompt signals which include utterance content in coded format, as disclosed only by applicant.

Thus, each of claims 5, 13, 15 and 24 is allowable for the same reasons discussed above regarding its respective parent claim Reconsideration and allowance are requested.

Paragraph 7

Claims 17-19 and 23 stand rejected under Section 103(a) as being unpatentable over Hollier and in view of US Patent 5,933,776 ("Kirkpatrick").

CLAIM 17

Claim 17 is directed to a "call-flow verification (CFV) sequence code . . . to activate a call-flow verification (CFV) mode". Particular elements of the claim comprise code digits:

- indicating the CFV mode is to be activated,
- indicating whether to include or exclude the speech (i.e., utterance) when providing an audio signal, and
- identifying the number of characters of an utterance to be represented by DTMF signals.

Consider the second such element, e.g., a frame digit indicating whether to include or exclude the utterance or speech in an audio signal. As already discussed, Hollier states that the "key measurement" to be made is the "quality of conversational speech". If the speech were excluded Hollier would be unable to make the "key measurement." Thus, exclusion of the speech would render Hollier inoperative for its intended purpose. As such, any option of excluding the speech is inconsistent with the teaching of Hollier and not disclosed or suggested by Hollier.

As to the third element, e.g., an extent digit indicating the number of characters of an utterance to be encoded as DTMF signals, it is also inconsistent with the teaching of Hollier. Hollier tests the quality of speech as affected by transmission over a transmission link and discloses nothing about encoding speech as DTMF signals or otherwise. At column 8, lines 31-35, Hollier discusses use of a label to identify transmitted speech as having originated from device 21 or device 22 of Fig. 1. However, that has nothing to do with identifying the number of utterance characters to be encoded as DTMF signals.

As to the first element, regardless of the relevance, or lack thereof, of Kirkpatrick to the identification digit as claimed, the Kirkpatrick disclosure fails to address the

inadequacy of teaching of Hollier regarding the "frame" and "extent" digit elements of claim 17 as discussed above.

It is respectfully submitted that the disclosures of Hollier and Kirkpatrick are inadequate to meet the requirements of a Section 103(a) rejection. When Hollier teaches the need to test the quality of transmitted speech, it cannot be obvious to override that teaching and replace the speech by coded signals. Neither reference provides teaching suggesting any reason for inclusion of utterance characters represented by DTMF signals.

Reconsideration and allowance of claim 17, as amended, are requested.

DEPENDENT CLAIMS 18, 19 and 23

These claims, which would become allowable with allowance of their respective parent claim, include additional distinguishing limitations.

For example, claim 19 addresses an identification digit indicating both activation and deactivation as specified. The inherent deactivation attributed to Kirkpatrick in the Office Action appears to be based only on applicant's teaching. The reference is silent on deactivation, which could occur automatically on completion of the Kirkpatrick test cycle, for example. In addition, the combination of Hollier and Kirkpatrick fails to provide teaching the "frame" and "extent" digit elements of claim 19.

Paragraph 8

Claim 20 stands rejected under Section 103(a) as being unpatentable over Hollier and in view of Kirkpatrick and further in view of US Patent 5,933,776 ("Ortiz Perez").

Claim 20 provides that the CFV sequence code includes two identification digits. The Office Action makes reference to the Ortiz Perez specification beginning at line 52 in

column 18. In that text reference is made to a "test activation code" used by the self-diagnostic system for cellular-transceiver systems, of Ortiz Perez. Ortiz Perez refers to a "message-completion bit" which would presumably have two states, possibly usable for "on" and "off." However, applicant found no reference to two digits.

In any event, Hollier, Kirkpatrick and Ortiz Perez, separately or in combination, fail to disclose or suggest any call-flow verification (CFV) sequence code comprising a combination of identification, frame and extent digits as provided, regardless of whether one, two or more identification digits are included. It is respectfully submitted that a conclusion as to inherency of two identification digits, in preference to only one digit, must be supported by some actual teaching or relevant suggestion in a reference.

SUMMARY

Entry and consideration of this amendment, reconsideration of all rejections and allowance of claims 1-24, as amended, are requested.

The cited references have not been shown to teach or suggest anything about call-flow verification, in general or as claimed. Also, there is no prior disclosure of use of prompt signals which include utterance content in coded format as disclosed and claimed by applicant, or of the resulting benefits provided in the context of efficient, high-speed call flow verification, with avoidance of errors inherent in reliance on voice recognition processing of received prompts. The invention as covered by the claims enables call-flow verification with benefits not suggested by the references. Consistent with this, it has been shown that the Hollier reference fails to anticipate because it does not teach the identical invention as claimed and it fails to teach or suggest each and every limitation as

set forth in the relevant claims. Further, it has been shown that the other references fail to provide disclosures which address the inadequacies of the Hollier reference, so as to meet the requirements of rejections under Section 103(a).

This application is considered to be in condition for allowance, which action is respectfully solicited.

Respectfully submitted,

Date: June 2, 2004

Kenneth P. Robinson
Attorney for Applicant

Reg. No.: 20,056
Tel. No.: 631 385 3255

474 New York Avenue
Huntington, NY 11743